

Amendments to the Claims

The listing of claims below replaces all prior versions, and listings, of claims in the subject application pursuant to 37 C.F.R. §1.121(c):

Claims

1. (Currently amended) A catalyst useful for removal of hydrogen sulphide from a gas streams containing the samehydrogen sulfide and its conversion of hydrogen sulfide to elemental sulphur, thesaid catalyst comprising 0 to 95% by weight clay, 05 to 95% by weight gypsum and, 0 to 95% by weight alumina, and 5 to 60% by weight hydrated iron oxide whenand heated to a temperatures between 100 and 650°C.
2. (Currently amended) A catalyst as claimed in claim 1,useful for the removal of hydrogen sulfide from a gas stream containing hydrogen sulfide and conversion of hydrogen sulfide to elemental sulfur, wherein said catalyst comprising 5 to 60% by weight clay, 5 to 80% by weight gypsum and, 5 to 40% by weight alumina, and 6 to 40% by weight hydrated iron oxide.
3. (Currently amended) A catalyst as claimed in claim 1, wherein clays are selected from the group comprising said clay is selected from the group consisting of Kalonite, Montmorillonite/Semectite, Illite and Chlorite.
4. (Currently amended) A catalyst as claimed in claim 3, wherein clays are said clay is selected from the Semectite group.

5. (Currently amended) A catalyst as claimed in claim 4, wherein ~~elay used said clay~~ is bentonite clay.
6. (Original) A catalyst as claimed in claim 1, wherein said catalyst contains ferric ions as active sites, which chemisorbs hydrogen sulphide present in the gas stream and converts the same into elemental sulphur.
7. (Currently amended) A catalyst as claimed in claim 1, wherein said catalyst has a pH value in the range of 8.0 to 10.0.
8. (Canceled)
9. (Original) A catalyst as claimed in claim 1, wherein 100gm of said catalyst chemisorbs 2860 to 28600 mg of hydrogen sulphide from said gas stream in one cycle.
10. (Canceled)
11. (Currently Amended) TheA catalyst as claimed in claim 39, wherein the regenerated catalyst is used to treats and removes hydrogen sulphide from the gas stream and converts the hydrogen sulfide from the gas stream same to elemental sulphur in the subsequent cycles of chemisorption and regeneration.
12. (Currently Amended) TheA catalyst as claimed in claim 11, wherein the catalyst is used in at least 15 chemisorption and regeneration cycles ~~during its use~~.
13. (Currently Amended) TheA catalyst as claimed in claim 11, wherein sulphides of iron present in the spent catalyst are is converted to Fe₂O₃ during regeneration

thereby producing elemental sulphur and regenerating the catalyst.

14. (Currently Amended) TheA catalyst as claimed in claim 13, wherein the elemental sulphur produced~~recovered~~ has a purity more than 99%.
15. (Currently Amended) TheA catalyst as claimed in claim 1, wherein said catalyst is used in fixed bed reactors or fluidized bed reactors.
16. (Currently Amended) TheA catalyst as claimed in claim 1, wherein said catalyst is divided into fine particles having particle size in the range of 100 μm to 2000 μm for use in the fluidized bed reactor.
17. (Currently Amended) TheA catalyst as claimed in claim 1, wherein said catalyst is palletized or granulated to obtain pellets/granules having diameter in the range of 0.5mm to 10.0 mm for use in fixed bed reactors.
18. (Withdrawn - Currently Amended) A process for preparing thea catalyst of claim 1 useful for removing hydrogen sulphide from a gas stream and recovering elemental sulphur therefrom, said process comprising the steps of:
 - a) mixing of 0 to 95% by weight clay, 50 to 95% by weight gypsum, 0 to 95% weight alumina and 5 to 60% by weight hydrated iron oxide; and
 - b) granulating, pelletizing or pulverizing the mixture of step (a) and heating to at the same temperature in the range of 100°C to 650°C so as to obtain the catalyst.
19. (Withdrawn) A process as claimed in claim 18, wherein in step (a), the hydrated iron oxide is prepared from

commonly available salts of iron such as ferric nitrate, ferric chloride, ferric sulphate and commonly available alkali such as ammonium hydroxide, sodium hydroxide and potassium hydroxide.

20. (Withdrawn) A process as claimed in claim 18, wherein 100gm of the catalyst thus obtained chemisorb 2860 to 28600 mg of hydrogen sulphide gas from the gas stream.
21. (Withdrawn) A process as claimed in 18, wherein the catalyst thus obtained has pH value in the range of 8.0 to 10.0.
22. (Withdrawn) A process as claimed in claim 18, wherein the catalyst thus obtained is used in fixed bed reactor or fluidized bed reactor.
23. (Withdrawn) A process as claimed in claim 18, wherein catalyst thus obtained contain ferric ions as active sites.
24. (Withdrawn) A process as claimed in claim 18, wherein the catalyst thus obtained is pulverized into fine particles for use in fluidized bed reactors.
25. (Withdrawn) A process as claimed in claim 18, wherein in step (b) the mixture of step (a) is pelletized or granulated to obtain pellets/granules having diameter in the range 0.5 mm to 10 mm for use in fixed bed reactors.
26. (Withdrawn - Currently Amended) A method for removal of ~~sulphur compounds sulfur compounds~~ from a gas stream comprising such sulfur compounds ~~the same and recovery of~~

~~elemental sulphur therefrom~~, said method comprising the steps of:

- a) mixing moist air/water with the gas stream comprising the sulfur compounds ~~sulphur compounds for so as to~~ converting the sulphur compounds to hydrogen sulphide,
- b) contacting the gas stream containing hydrogen sulphide with ~~thea catalyst comprising 0 to 95% by weight clay, 0 to 95% by weight gypsum, 0 to 95% by weight alumina and 5 to 60% by weight hydrated iron oxide of claim 1~~ so as to remove hydrogen sulphide by chemisorption, and
- c) regenerating the ~~spent catalyst from a spent catalyst resulting from step b)~~ by passing air through or over the same to ~~oxides of iron~~ and converting iron sulphides to iron oxides and elemental sulphur.

27. (Withdrawn) A method as claimed in claim 26, wherein compounds of sulphur are hydrogen sulphide, carbonyl sulphide (COS), and carbon disulphide (CS₂) and mixtures thereof.
28. (Withdrawn) A method as claimed in claim 26, wherein the gas streams containing hydrogen sulphide from trace level to 100% level is treated to get outlet gas stream free of the same.
29. (Withdrawn) A method as claimed in claim 26, wherein the color of the catalyst changes from reddish brown to black during step (b) chemisorption and it changes back to reddish brown on regeneration, this property being useful in visually monitoring the progress of the chemisorption and regeneration cycles respectively.

30. (Withdrawn) A method as claimed in claim 26, wherein the spent catalyst is regenerated by passing an oxygen containing gas through or over the same.
31. (Withdrawn) A method as claimed in claim 26, wherein removal of the sulphur compound from the gas stream and regeneration of catalyst are optionally carried out simultaneously.
32. (Withdrawn) A method as claimed in claim 26, wherein removal of the sulphur compound from the gas stream and regeneration of catalyst are simultaneously carried out by contacting gas stream containing sulphur compounds and an oxygen containing gas simultaneously with the catalyst.
33. (Withdrawn) A method as claimed in claim 26, wherein the rate of simultaneous reaction and regeneration of catalyst depends on the flow rates of gas stream, and ratio of gas stream and oxygen containing gas as well as the hydrogen sulphide content of the gas stream.
34. (Withdrawn) A method as claimed in claim 26, wherein the percentage of regeneration of spent catalyst is 100% when oxygen containing as is passed through or over the spent catalyst.
35. (Withdrawn) A method as claimed in claim 26, wherein the process is carried out in fluidized bed reactors or fixed bed reactors.
36. (Withdrawn) A method as claimed in claim 26, wherein the elemental sulphur obtained has purity of more than 99%.

37. (Withdrawn) A method as claimed in claim 26, wherein 100 gm of said catalyst chemisorbs 2860 to 28600 mg of hydrogen sulphide from said gas stream in one cycle.

38. (Canceled)

39. (New) A catalyst regenerated by passing air through a spent catalyst at ambient temperature, wherein the spent catalyst comprises sulfides of iron and is produced from the catalyst of claim 1 in the presence of a gas stream containing hydrogen sulfide.